

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### NO DRAWINGS

#### Improvements in or relating to Preserving Foodstuffs

We, HENKEL & CIE G.m.b.H. a German Company, of 67, Henkelstrasse, Duesseldorf-Holthausen, Germany, do hereby declare the invention, for which we pray that a patent 5 may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to methods for preserving perishable foodstuffs and more 10 particularly to fish.

It is known that perishable foods, particularly meat and fish, may be preserved by being placed in ice. It is also known to increase the preserving effects of the ice by 15 adding germicidal substances, for example, calcium hypochlorite, boric acid, or hydrogen peroxide to the ice. This process was not satisfactory however on account of the easy decomposition and the strong bleaching 20 action of the hydrogen peroxide. Recently, fish has been preserved in ice to which have been added antibiotics, especially chlorotetracycline and in this way, a very good 25 germicidal effect has been obtained. However, the preservation of foodstuffs by means of these substances is not completely harmless and is prohibited in some countries.

It has now been found that easily perishable foodstuffs, and especially fish, may be 30 preserved particularly advantageously by means of ice containing peracetic acid.

The use of peracetic acid for preserving foodstuffs, is physiologically harmless, because it decomposes under heat into harmless 35 substances, namely acetic acid, water and oxygen. On the other hand, the preserving effect of ice containing peracetic acid is as good as that of ice containing the much more expensive aureomycine. In comparison with 40 hydrogen peroxide, the use of peracetic acid has the advantage that the germicidal action is much stronger. Since hydrolysis of peracetic acid to acetic acid and hydrogen

peroxide at 0°C. takes place only very slowly, ice containing peracetic acid can be 45 stored for months without reducing the germicidal effect to any appreciable degree. An advantage, compared with hydrogen peroxide, is that in concentrations suitable for germicidal activity the bleaching effect of 50 peracetic acid is very small.

According to the invention, ice is used containing 0.001 - 0.1%, and preferably about 0.01% of peracetic acid. The manufacture of this ice presents no difficulties, 55 because peracetic acid is soluble in water. It is only necessary to take care that the freezing is controlled with a view to prevent separation of the solution; this may be achieved easily by mechanical agitation, for 60 example, by stirring.

In many cases, especially when preserving salt water fish, salt is preferably added to the water used for the manufacture of the ice, or seawater is used. In this way the osmotic 65 pressure of the cell liquid of the fish is in balance with the melting water pressure. In consequence, the tissue of the fish is not stressed by osmotic over-or under-pressures and the fish maintains its natural appearance 70 for longer periods. In addition, the addition of salt to the water reduces the freezing temperature and increases thereby the cooling effect.

The invention will now be further 75 described by way of an example.

#### Example.

Bactericidal ice was made by freezing, as quickly as possible, a 0.01% aqueous solution of peracetic acid under medium agitation. The resulting ice was broken up into pieces of about 5 to 10 mm size.

Of three herrings, one was packed in 5-10 mm pieces of ordinary ice (Fish A), the second in the germicidal ice of the invention 85 (Fish B) and the third in ice containing

0.001% chlorotetracycline (Fish C). The three herrings were stored in a refrigerator at -2 to -3°C. At various times, specimens were taken from the surface of the fishes, and the number of micro organisms was estimated. These specimens were taken by means of a germ-free carrier (edge length 26 mm.) which was used to scrape a substantially square area of the surface under light pressure, without damaging the skin, and the scrapings were suspended in 0.5 ml. of sterile water. After thorough agitation, the number of micro organisms was determined in this suspension. The resulting values are summarized in the following table.

Time	Place of specimen extraction	Fish	Micro organisms per ml.
Shortly after storing	Tail, left side	A	45 10 <sup>4</sup>
		B	30 10 <sup>4</sup>
		C	30 10 <sup>4</sup>
After 2 days	Head, left side	A	66 10 <sup>4</sup>
		B	14 10 <sup>4</sup>
		C	13.1 10 <sup>4</sup>
After 6 days	Back, centre left	A	7900 10 <sup>4</sup>
		B	10.5 10 <sup>4</sup>
		C	38 10 <sup>4</sup>
After 6 days	Back, centre right	A	189 10 <sup>4</sup>
		B	96 10 <sup>4</sup>
		C	50 10 <sup>4</sup>

This example shows that the method

according to the invention gives excellent results when the fish is stored at temperatures below 0°C. Here the fish does not come into contact with fresh melting water containing peracetic acid, as with storage above 0°C., and the preserving effect is considerably increased. It is to be understood however that the fish can be stored at a higher temperature with the result that the ice melts slowly.

#### WHAT WE CLAIM IS:

1. A method for preserving easily perishable foods which comprises storing the food in ice containing peracetic acid. 45

2. A process as claimed in claim 1 in which the food is fish.

3. A method as claimed in any preceding claim in which the ice contains 0.001 to 0.1% peracetic acid. 50

4. A method as claimed in claim 2 in which the ice contains 0.01% peracetic acid.

5. A method as claimed in any preceding claim in which the ice also contains common salt. 55

6. A method for preserving food substantially as hereinbefore described with reference to the example.

W. P. THOMPSON & CO.  
12, Church Street, Liverpool, 1.  
Chartered Patent Agents.